**Arrays**

**Analysis**

The Arrays program will have two users inputting scores from rolling dice. It will read in these scores, order them, then decide how many points the rolls deserve, compare these scores and determine a winner. The winner of each round, total number of rounds won for each player, total points of each player, the average points of each player and the player with the highest points will also be outputted.

**Design**

There will be two classes; Dice and DiceUser. DiceUser will get the scores from the users and pass them to the Dice class. It will also output the scores and other results calculated within the Dice class, but it will calculate the total points and average points scored by the users. The Dice class will compare the numbers given by both users and order them to determine what points they get. It will then compare the points scored by both users against each other to decide who has won that particular round.

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| --- |
| **Dice** |
| - first: double  - second: double  - third: double  - newFirst: double  - newSecond: double  - newThird: double  - rollArray: double  - first2: double  - second2: double  - third2: double  - newFirst2: double  - newSecond2: double  - newThird2: double  - rollArray2: double  +points: integer  +points2: integer |
| + sort()  + result()  + sortedRoll1()  + sortedRoll2()  + sortedRoll3()  + sort2()  + result2()  + sortedRoll12()  + sortedRoll22()  + sortedRoll32() |

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| --- |
| **DiceUser** |
|  |
| + main(String[] args) |

**Pseudo Code**

Public class diceUser

Main = string args

Create new dice object

Create new scanner

Set player one and twos; first, second and third roll values, and their total points

Start For loop

Get player 1 first roll value

Start IF

First <1 or First >6

Invalid choice

End IF

Start else

Get second roll value

End else

Start IF

Second <1 or Second >6

Invalid choice

End IF

Start else

Get third roll value

End else

Start IF

Third <1 or Third >6

Invalid choice

End IF

Start else

Get player 2 first roll value

Start IF

First <1 or First >6

Invalid choice

End IF

Start else

Get second roll value

End else

Start IF

Second <1 or Second >6

Invalid choice

End IF

Start else

Get third roll value

End else

Start IF

Third <1 or Third >6

Invalid choice

End IF

Start else

Create new dice class

Call sorting array

Output the three values for both players

Output the values in order for both players

Output winner

End else

End For

Output both players total score

Output both players average scores

Output overall winner

End

Public class Dice

Create constructor

Method = sort

Create new array

Assign roll values

Sort values

Assign the sorted array values to new variables

Method = sort2

Create new array

Assign roll values

Sort values

Assign the sorted array values to new variables

Method = result

Start IF

First = second and first = third

Return points value

End IF

Start else

(First+1 = second) and (second+1 = third)

Return points value

End else

Start else

(First != second) and (second != third)

Return points value

End else

Start else

Return points value

End else

Method = result2

Start IF

First = second and first = third

Return point value

End IF

Start else

(First+1 = second) and (second+1 = third)

Return points value

End else

Start else

(First != second) and (second != third)

Return points value

End else

Start else

Return points value

End else

Method = sortedRoll1

Return ordered roll 1

Method = sortedRoll2

Return ordered roll 2

Method = sortedRoll3

Return ordered roll 3

Method = sortedRoll12

Return ordered roll 1

Method = sortedRoll22

Return ordered roll 2

Method = sortedRoll32

Return ordered roll 3

Method = winner

Start IF

Player 1 beats player 2

Output player 1 winner

End IF

Start else

Output player 2 winner

End else

**Testing**

|  |  |  |
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| **Test** | **Expected** | **Actual** |
| The players will enter scores below 1 | The values will be rejected | Code wouldn’t compile |
| The players will enter scores above 6 | The values will be rejected |  |
| The players will enter scores that aren’t integers | The values will be rejected |  |
| Player 1 will score three of a kind and player 2 a pair | Player 1 will win |  |
| Player 2 will score three of a kind and player 1 a pair | Player 2 will win |  |
| Player 1 will score a pair and player 2 a run | Player 1 will win |  |
| Player 2 will score a pair and player 1 a run | Player 2 will win |  |
| Player 1 will score a run and player 2 all different | Player 1 will win |  |
| Player 2 will score a run and player 1 all different | Player 2 will win |  |